



DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Parts 223 and 224

[Docket No. 211217-0264; RTID 0648–XR120]

Endangered and Threatened Wildlife; 90-Day Finding on a Petition To List the Sunflower Sea Star as Threatened or Endangered Under the Endangered Species Act

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: 90-day petition finding, request for information, and initiation of status review.

SUMMARY: We, NMFS, announce a 90-day finding on a petition to list the sunflower sea star (*Pycnopodia helianthoides*) as threatened or endangered under the Endangered Species Act (ESA) and to designate critical habitat concurrent with the listing. We find that the petition presents substantial scientific information indicating that the petitioned action may be warranted. Therefore, we are initiating a status review of the species to determine whether listing under the ESA is warranted. To ensure this status review is comprehensive, we are soliciting scientific and commercial information regarding this species.

DATES: Scientific and commercial information pertinent to the petitioned action must be received by *[insert date 60 days after date of publication in FEDERAL REGISTER]*.

ADDRESSES: You may submit comments on this document, identified by NOAA–NMFS–NOAA-NMFS-2021-0130 by the following method:

- *Electronic Submissions:* Submit all electronic public comments via the Federal eRulemaking Portal. Go to <https://www.regulations.gov> and enter NOAA–

NMFS–NOAA–NMFS–2021–0130 in the Search box. Click on the “Comment”

icon, complete the required fields, and enter or attach your comments.

Instructions: Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered by NMFS. All comments received are a part of the public record and will generally be posted for public viewing on *www.regulations.gov* without change. All personal identifying information (*e.g.*, name, address), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. NMFS will accept anonymous comments (enter “N/A” in the required fields if you wish to remain anonymous).

Interested persons may obtain a copy of the petition online at the NMFS website:

<https://www.fisheries.noaa.gov/national/endangered-species-conservation/petitions-awaiting-90-day-findings>.

FOR FURTHER INFORMATION CONTACT: Dayv Lowry, NMFS West Coast Region, Protected Resources Division, (253) 317–1764, *David.Lowry@noaa.gov*.

SUPPLEMENTARY INFORMATION:

Background

On August 18, 2021, we received a petition from the Center for Biological Diversity to list the sunflower sea star (*Pycnopodia helianthoides*) as a threatened or endangered species under the ESA and to designate critical habitat concurrent with the listing. The petition asserts that the sunflower sea star is threatened by all five ESA section 4(a)(1) factors: (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; and (5) other natural or manmade factors affecting its continued existence. The petition is available online (see **ADDRESSES**).

ESA Statutory, Regulatory, and Policy Provisions and Evaluation Framework

Section 4(b)(3)(A) of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*), requires, to the maximum extent practicable, that within 90 days of receipt of a petition to list a species as threatened or endangered, the Secretary of Commerce shall make a finding on whether that petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted, and promptly publish such finding in the **Federal Register** (16 U.S.C. 1533(b)(3)(A)). If NMFS finds that substantial scientific or commercial information in a petition indicates the petitioned action may be warranted (a “positive 90-day finding”), we are required to promptly commence a review of the status of the species concerned, during which we will conduct a comprehensive review of the best available scientific and commercial data. We conclude the review with a finding as to whether, in fact, the petitioned action is warranted within 12 months of receipt of the petition. Because the finding at the 12-month stage is based on a more thorough review of the best available information, as compared to the narrow scope of review at the 90-day stage, a “positive 90-day” finding does not prejudice the outcome of the status review.

Under the ESA, a listing determination may address a species, which is defined to also include subspecies and, for any vertebrate species, any distinct population segment (DPS) that interbreeds when mature (16 U.S.C. 1532(16)). A species, subspecies, or DPS is “endangered” if it is in danger of extinction throughout all or a significant portion of its range, and “threatened” if it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (16 U.S.C. 1532(6) and (20)). Pursuant to the ESA and our implementing regulations, we determine whether species are threatened or endangered based on any one or a combination of the following five ESA section 4(a)(1) factors: (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational,

scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; and (5) other natural or manmade factors affecting its continued existence (16 U.S.C. 1533(a)(1); 50 CFR 424.11(c)).

ESA-implementing regulations issued jointly by NMFS and the U.S. Fish and Wildlife Service (50 CFR 424.14(h)(1)(i)) define “substantial scientific or commercial information” in the context of reviewing a petition to list, delist, or reclassify a species as credible scientific or commercial information in support of the petition’s claims such that a reasonable person conducting an impartial scientific review would conclude that the action proposed in the petition may be warranted. Conclusions drawn in the petition without the support of credible scientific or commercial information will not be considered substantial information. In reaching the 90-day finding on the petition, we considered the information described in sections 50 CFR 424.14(c), (d), and (g).

Our determination as to whether the petition provides substantial scientific or commercial information indicating that the petitioned action may be warranted depends in part on the degree to which the petition includes the following types of information: (1) information on current population status and trends and estimates of current population sizes and distributions, both in captivity and the wild, if available; (2) identification of the factors under section 4(a)(1) of the ESA that may affect the species and where these factors are acting upon the species; (3) whether, and to what extent, any or all of the factors alone or in combination identified in section 4(a)(1) of the ESA may cause the species to be an endangered species or threatened species (*i.e.*, the species is currently in danger of extinction or is likely to become so within the foreseeable future), and, if so, how high in magnitude and how imminent the threats to the species and its habitat are; (4) information on adequacy of regulatory protections and effectiveness of conservation activities by States, as well as other parties, that have been initiated or that are ongoing, that may protect the species or its habitat; and (5) a complete, balanced

representation of the relevant facts, including information that may contradict claims in the petition. See 50 CFR 424.14(d).

If the petitioner provides supplemental information before the initial finding is made and states that it is part of the petition, the new information, along with the previously submitted information, is treated as a new petition that supersedes the original petition, and the statutory timeframes will begin when such supplemental information is received. See 50 CFR 424.14(g).

We may also consider information readily available at the time the determination is made. We are not required to consider any supporting materials cited by the petitioner if the petitioner does not provide electronic or hard copies, to the extent permitted by U.S. copyright law, or appropriate excerpts or quotations from those materials (*e.g.*, publications, maps, reports, letters from authorities). See 50 CFR 424.14(c)(6) and (h)(1)(ii).

The substantial scientific or commercial information standard must be applied in light of any prior reviews or findings we have made on the listing status of the species that is the subject of the petition (50 CFR 424.14(h)(1)(iii)). Where we have already conducted a finding on, or review of, the listing status of that species (whether in response to a petition or on our own initiative), we will evaluate any petition received thereafter seeking to list, delist, or reclassify that species to determine whether a reasonable person conducting an impartial scientific review would conclude that the action proposed in the petition may be warranted despite the previous review or finding. Where the prior review resulted in a final agency action—such as a final listing determination, a 90-day not-substantial finding, or a 12-month not-warranted finding—a petition will generally not be considered to present substantial scientific and commercial information indicating that the petitioned action may be warranted unless the petition

provides new information or analysis not previously considered. See 50 CFR 424.14(h)(1)(iii).

At the 90-day finding stage, we do not conduct additional research, and we do not solicit information from parties outside the agency to help us in evaluating the petition. We accept the petitioners' sources and characterizations of the information presented if they appear to be based on accepted scientific principles, unless we have specific information in our files that indicates the petition's information is incorrect, unreliable, obsolete, or otherwise irrelevant to the requested action. Information that is susceptible to more than one interpretation, or that is contradicted by other available information, will not be dismissed at the 90-day finding stage, so long as it is reliable and a reasonable person conducting an impartial scientific review would conclude it supports the petitioners' assertions. In other words, conclusive information indicating the species may meet the ESA's requirements for listing is not required to make a positive 90-day finding. We will not conclude that a lack of specific information alone necessitates a negative 90-day finding if a reasonable person conducting an impartial scientific review would conclude that the unknown information itself suggests the species may be at risk of extinction presently, or within the foreseeable future.

To make a 90-day finding on a petition to list a species, we first evaluate whether the information presented in the petition, alongside information readily available in our files, indicates that the petitioned entity constitutes a "species" eligible for listing under the ESA. Next, if we conclude the petition presents substantial scientific or commercial information suggesting that the petitioned entity may constitute a species, we evaluate whether the information indicates that the species may face an extinction risk such that listing, delisting, or reclassification may be warranted; this may be indicated in information expressly discussing the species' status and trends, or in information describing impacts and threats to the species. We evaluate whether the petition presents

any information on specific demographic factors pertinent to evaluating extinction risk for the species (*e.g.*, population abundance and trends, productivity, spatial structure, age structure, sex ratio, diversity, current and historical range, habitat integrity or fragmentation), and the potential contribution of identified demographic risks to extinction risk for the species. We then evaluate whether the petition presents information suggesting potential links between these demographic risks and the causative impacts and threats identified in section 4(a)(1) of the ESA.

Information presented on impacts or threats should be specific to the species and should reasonably suggest that one or more of these factors may be operative threats that act, or have acted, on the species to the point that it may warrant protection under the ESA. Broad statements about generalized threats to the species, or identification of factors that could negatively impact a species, do not constitute substantial information indicating that listing may be warranted. We look for information indicating that not only is the particular species exposed to a factor, but that the species may be responding in a negative fashion. We then assess the potential significance of that negative response.

Many petitions identify risk classifications made by nongovernmental organizations, such as the International Union for Conservation of Nature (IUCN), the American Fisheries Society, or NatureServe, as evidence of extinction risk for a species. Risk classifications by other organizations or made under other Federal or State statutes may be informative, but such classification alone may not provide the rationale for a positive 90-day finding under the ESA. For example, as explained by NatureServe, their assessments of a species' conservation status do "not constitute a recommendation by NatureServe for listing under the U.S. Endangered Species Act" because NatureServe assessments "have different criteria, evidence requirements, purposes and taxonomic coverage than government lists of endangered and threatened species, and therefore these two types of lists should not be expected to coincide"

(<https://explorer.natureserve.org/AboutTheData/DataTypes/ConservationStatusCategories>). Additionally, species classifications under IUCN and the ESA are not equivalent; data standards, criteria used to evaluate species, and treatment of uncertainty are also not necessarily the same. Thus, when a petition cites such classifications, we will evaluate the source of information that the classification is based upon in light of the standards on extinction risk and impacts or threats discussed above.

Distribution, Habitat, and Life History

The sunflower sea star occurs throughout intertidal and subtidal coastal waters of the Northeast Pacific Ocean from the Aleutian Islands, Alaska, to at least the Southern California Bight, and is present on a wide variety of substrate types (Britton-Simmons *et al.* 2012, Gravem *et al.* 2021). Individuals may also occupy waters off the west coast of the Baja Peninsula southward to the vicinity of San Ignacio Lagoon, though data from this region are sparse (Gravem *et al.* 2021). While most abundant in waters less than 25 meters (m) deep, sunflower sea stars can be found at considerably lower densities as deep as 300 m (Gravem *et al.* 2021).

Sunflower sea stars are broadcast spawners that require close proximity to mates for successful fertilization (Morris *et al.* 1980, Lambert 2000, Lundquist and Botsford 2004, Hodin *et al.* 2021). While it is unclear whether individuals aggregate to spawn, documentation of seasonal, patchy distribution suggests this may be the case (Mauzey *et al.* 1968, Gravem *et al.* 2021). Though reproductive seasonality is largely undocumented, localized studies have documented breeding from December through June (Feder and Christensen 1966, Morris *et al.* 1980, Gravem *et al.* 2021), and broad geographic variation linked with water temperature and other environmental factors is likely.

Fertilization of eggs is followed by a free-floating larval period of 50-146 days (Strathmann 1978, Gravem *et al.* 2021), during which considerable wind- and current-driven dispersion may occur. Individuals then settle and metamorphose into juveniles,

which continue to feed and grow. Though age at first maturity remains unknown for the sunflower sea star, the well-studied ochre star *Pisaster ochraceus*, another large predatory sea star that shares habitat, diet, and reproductive strategy with the sunflower sea star, first reproduces at age 5 (Menge 1975). As is common for a broad diversity of marine species, it is also likely that sunflower sea star fecundity increases with size (Gravem *et al.* 2021). Sea star size is strongly affected by environmental factors such as temperature and food availability (Sebens 1987, Gooding *et al.* 2009), making size a poor indicator of age, but estimates suggest that maximum age could be as high as 68 years, but is more typically ~15 years in the wild (Gravem *et al.* 2021).

Status and Population Trends

There is no single, systematically collected data set that provides population size or long-term trend data for sunflower sea stars throughout their range. A recent compilation by the IUCN of localized data sets spanning from the Aleutian Islands, Alaska, to Baja California, Mexico, compared regional trends to evaluate range-wide status (Gravem *et al.* 2021; Hamilton *et al.* 2021). While considerable variability was apparent in many locations, since 2000 nearly all data sets considered indicate substantial regional declines in average density, with some declines exceeding 90 percent. From 2013-17, an outbreak of sea star wasting syndrome (SSWS) contributed to precipitous population declines in several areas, with impacts progressing sequentially from south to north (Gravem *et al.* 2021). Data were not collected evenly over time and space, however, making some estimates of decline less reliable than others. Additionally, most data were collected from shallow, nearshore areas such that deep-water abundance could only be estimated for the whole of the range rather than on a regional level. As noted above, most sunflower sea stars occupy waters less than 25 m deep, minimizing the relevance of this shortcoming in regionalized data collection. Bearing these caveats in mind, researchers estimated that global sunflower sea star population size declined by

90.6 percent from 2013-17 due to SSWS (Gravem *et al.* 2021), and minimal recovery has been noted since (Hamilton *et al.* 2021). Not only has population size decreased, but area of occupancy has also declined by an estimated 57.6 percent since the SSWS outbreak, and sunflower sea stars have not been detected in several surveys where they were once common components of the catch (Gravem *et al.* 2021).

In sum, while data on abundance and trends are incomplete and likely span only one generation time for the species, the information presented in the petition indicates that sunflower sea star populations have declined throughout the species' range, with especially steep declines from 2013-17.

Analysis of ESA Section 4(a)(1) Factors

The petitioners assert that *P. helianthoides* is endangered or threatened because of all five of the ESA section 4(a)(1) factors: the present or threatened destruction, modification, or curtailment of its habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; inadequacy of existing regulatory mechanisms to address identified threats; and other natural or manmade factors affecting its continued existence, including climate change. Information in the petition and information that was readily available in our files indicate that the primary threat facing the species is disease, specifically SSWS. We briefly reiterate the evidence for each of the five factors, as presented in the petition, below.

Present or threatened destruction, modification, or curtailment of its habitat or range

The petitioner asserts that the SSWS outbreak that occurred from 2013-17 resulted in an estimated 57.6 percent decline in area of occupancy throughout the sunflower sea star's known range (Gravem *et al.* 2021), representing substantial range curtailment. This includes evidence for local extirpation of the species in some regions, such as along the outer coasts of Washington, Oregon, California, and Mexico. The petition also notes that shoreline armoring, coastal development, erosion, pollution,

shipping, harmful algal blooms, and invasive species all represent habitat stressors in the nearshore environments preferred by sunflower sea stars. While there is substantial variation in the intensity and interactivity of these stressors across the range of the sunflower sea star, urbanized estuaries like San Francisco Bay and the Salish Sea are likely to be especially heavily impacted. Given that these urbanized areas historically contained substantial populations, the overall impact on sunflower sea stars may be substantial.

Overutilization for commercial, recreational, scientific or educational purposes

Sunflower sea stars are not specifically targeted in any commercial fisheries, but are a component of bycatch in several pot, trap, trawl, and seine fisheries. Removing individuals from such gear may lead to injury or mortality. Recreational harvest is also permitted in Alaska, Oregon, California, and Mexico, although it is banned in Washington. Dried sunflower sea stars are also sold as curios and for home decoration. While direct loss of sunflower sea stars by these methods, in total, is believed to be low, the petition contends that even small effects could exacerbate the effects of low population size.

Disease or predation

The petitioners assert that the species is endangered or threatened primarily because of population declines caused by SSWS. As discussed above in **Status and Population Trends**, SSWS has caused an estimated population decline of over 90 percent on a range-wide basis and local extirpation in some regions. The high lethality and broad-scale losses of sea stars due to SSWS may substantially impede access to mates, resulting in reduced population viability and resilience, and increasing extinction risk (Gravem *et al.* 2021).

Inadequacy of existing regulatory mechanisms

The petitioner notes two broad areas in which existing regulatory mechanisms are inadequate to address threats to the species: the control/prevention of SSWS and other diseases; and the regulation of greenhouse gas emission and climate change impacts, especially warming ocean temperatures, which may exacerbate disease outbreaks. The petition notes that status reviews for other species have acknowledged that there are no effective mechanisms to regulate greenhouse gas emissions on the national or international level.

Other natural or manmade factors

The petitioners assert that climate change, sea level rise, and ocean acidification all represent range-wide threats to the continued existence of the sunflower sea star, according to the petition. Sea level rise may lead to increased shoreline armoring and loss of habitat, while increased sea surface temperature can exacerbate disease outbreaks. Ocean acidification affects sunflower sea star prey viability in the Northeast Pacific Ocean, causing physiological stress for a variety of bivalves and other organisms that rely on calcium deposition to create protective shells (Bednarsek *et al.* 2021). Increased acidity also directly inhibits growth and development of larval and juvenile sea stars, as well as affecting metabolic rate, energy demand, and arm regeneration rate in adults.

Petition Finding

After reviewing the petition, the literature cited in the petition, and other information readily available in our files, we conclude the petition presents substantial scientific information indicating that the petitioned action to list *P. helianthoides* as a threatened or endangered species may be warranted. Therefore, in accordance with section 4(b)(3)(A) of the ESA and NMFS' implementing regulations (50 CFR 424.14(h)(2)), we will commence a status review to determine whether the sunflower sea star is in danger of extinction throughout all of a significant portion of its range, or likely to become so within the foreseeable future throughout all or a significant portion of its

range. As required by section 4(b)(3)(B) of the ESA, within 12 months of the receipt of the petition (August 18, 2022), we will make a finding as to whether listing the sunflower sea star as an endangered or threatened species is warranted. If listing is warranted, we will publish a proposed rule and solicit public comments before developing and publishing a final rule.

Information Solicited

To ensure that the status review is based on the best available scientific and commercial data, we are soliciting comments and information from interested parties on the status of the sunflower sea star. Specifically, we are soliciting information in the following areas:

(1) Historical and current abundance and population trends of *P. helianthoides* at all available geographic scales throughout its range;

(2) Historical and current distribution and population structure of *P. helianthoides*;

(3) Historical and current condition of habitat for *P. helianthoides*;

(4) Historical and current data on bycatch and retention of *P. helianthoides* in commercial, artisanal, and recreational fisheries worldwide;

(5) Data on trade of *P. helianthoides*, including dried specimens sold as curios;

(6) Historical and current impacts of SSWS on *P. helianthoides* at all available geographic scales throughout its range;

(7) The effects of other known or potential threats to *P. helianthoides* over the short-term or long-term; and

(8) Management, regulatory, or conservation programs that may be relevant for *P. helianthoides*, including mitigation measures related to any known or potential threats to the species throughout its range.

We request that all data and information be accompanied by supporting documentation such as maps, bibliographic references, or reprints of pertinent publications. Please send any comments in accordance with the instructions provided in the **ADDRESSES** section above. We will base our findings on a review of the best available scientific and commercial information available, including all information received during the public comment period.

References Cited

A complete list of all references cited herein is available upon request (See **FOR FURTHER INFORMATION CONTACT**).

Authority: The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: December 20, 2021.

Samuel D. Rauch, III,

Deputy Assistant Administrator for Regulatory Programs,

National Marine Fisheries Service.

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